

THE FORMATION OF AN ARTIFICIAL VAGINA BY INTESTINAL TRANSPLANTATION.

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OF the propriety of establishing a vagina, in cases in which this canal is absent either as a congenital defect or an acquired deformity, there seems to be no question, even when the canal is thus established purely for coitional purposes.

The early operations for this object consisted in making an opening in the cellular tissue between the bladder and the rectum, and attempting to maintain it by the wearing of some form of tampon or plug. These attempts, for reasons which are well understood, uniformly failed.

The more common method of operating consists in taking strips of mucocutaneous and cutaneous tissue from the vulva and internal aspects of the thighs, introducing these strips into a channel previously made between the rectum and bladder, and maintaining them in position by gauze packing until they unite to the cellular tissue, and thus make the opening permanent. Several quite ingenious devices have been resorted to for the purpose of maintaining this apposition.

An important modification of this method was proposed and carried out by Beck, of New York, some five years ago. (ANNALS OF SURGERY, October, 1900.) He first made a transverse incision immediately above the symphysis pubis, as though about to make a transverse suprapubic cystotomy. This incision was carried carefully downward between the peritoneum and bladder, hugging the bladder closely, until he reached the space between the bladder and rectum. He then made a counter-opening in the usual way from the perineum to meet the passage which he had already established. In this way he made a canal extending from the perineum to above the pubes,

but without opening the peritoneal cavity. Two skin flaps were then dissected from the thighs, their bases being represented by the labia, and their length being sufficient to extend through the entire length of the newly formed canal. These flaps were then seized with forceps introduced from above, drawn through the canal and fastened by stitches at the upper end, and the suprapubic wound closed. Iodoform gauze was then introduced from below so as to press the flaps laterally against the sides of the passage.

Other operators, acting on the suggestion of Mackenrodt, have endeavored to cover the surface of the new vagina by mucous membrane taken from another patient operated upon at the same clinic, while in a case recently reported the surgeon was able to line the new canal with the inverted mucous membrane of an enormously hypertrophied clitoris which he amputated at the same time.

Sneguireff (*Arch. de Tocol. et de Gynæc.*, Paris, 1892) reports a case in which he utilized a portion of the rectum in the formation of a new vagina. His operation consisted in making an incision through the skin and subjacent tissues along the border of the lower portion of the sacrum and coccyx to the posterior border of the anus. The coccyx was resected transversely across the incision, and with the finger the rectum was separated from the anterior face of the coccyx. The gut was stripped from its surrounding parts, drawn into the incision, and ligated in two places and cut. The superior portion was separated from the bladder and its environments, drawn down to the base and sutured to the right of the resected coccyx. It (*i.e.*, the superior segment of the rectum) was found surrounded by some fibres of the levator ani, and these were secured with it to act as a third anal sphincter. The inferior segment was brought down and its upper end closed by continuous suture, forming the cul-de-sac or cavity of the new vagina. The results of the operation were excellent, and union took place *per primam*. Fourteen days later, a second operation was done for the formation of the vulvar opening. This consisted in making an incision through the fibrous ring situated

between the anus and lower border of the urethra, uniting the rectal mucous membrane by continuous suture to the adjacent parts, and transforming the circular opening into a longitudinal one, surrounded by the labia minora and presenting a striking resemblance to the normal vaginal orifice. Union by first intention. The vagina measured three inches in depth and was capable of a certain amount of contraction. No faecal incontinence. One year later she wrote that she had perfect control over the bowels and flatus, and that coition was accomplished in a normal manner. (Just what was done with the anus in this case does not appear from the text of the report, nor from the three cuts which accompany it. Apparently, however, the anus was incised anteriorly, so that with its sphincter it constituted the borders of the posterior portion of the introitus of the new vagina.)

With the possible exception of the operation last described, to inquiries concerning the later history of which the operator has failed to reply, these operations seem to have proven quite generally defective, from the ultimate cicatricial contraction of the new canal. The result in Beck's case was unusually good, but even in that after a few months of marital experience the husband deserted his wife.

Mucous membrane long exposed comes to form a very fair substitute for skin; but the converse of this is not true, and a skin-lined vagina must differ very widely from one lined with a normal mucous membrane.

I was recently consulted in the case of a young woman, nineteen years of age, married a little over a year, who some six months before she consulted me had been delivered at term by instruments and after craniotomy. Following her delivery there had been an apparent sloughing of the entire vagina. Healing had taken place, and the perineum was perfectly smooth, except for a very small sinus, so small and tortuous that the smallest probe could not be inserted. No history was obtainable to determine the extent of the sloughing, and the presumption was that we were dealing with a partial atresia of the vagina, for the relief of which a plastic operation might be

made by the usual method. Accordingly, a careful dissection was made upward between the bladder and rectum, but not a trace of vaginal wall could be found at any point. The uterus was finally reached, but no cervix could be made out. The cervix seemed to have sloughed away with the vagina. Douglas's cul-de-sac was opened, and through this the lower segment of the womb could be quite thoroughly outlined. The opening which had thus been made was carefully packed with iodoform gauze, and the patient sent to her room, with the expectation that forty-eight hours later a second operation might be made for the maintenance of the new canal. She absolutely refused,

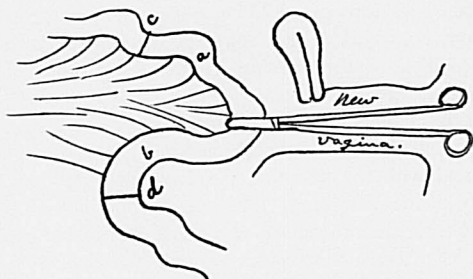


FIG. 1.—*a, b*, Sigmoid; *c, d*, points for section.

however, to have anything more done (especially as another physician at this stage had volunteered to maintain the patency of the canal by the introduction of a glass plug), and passed from observation.

The method which I had planned to carry out in this case was to utilize for the lining of the new vagina the sigmoid flexure of the colon, or a loop from the lower end of the ileum. The abdomen was to be opened and the sigmoid seized at about its centre by a pair of forceps introduced from below through the new canal and drawn down to the perineum. The length of bowel thus drawn down was next to be detached, with the usual precautions, by a transverse incision through the gut, but without injuring the vessels in the mesocolon, the continuity of

the colon being at once restored by an anastomosis. One end of the vaginal loop would then be inverted and closed by a continuous suture, not penetrating the mucous membrane. By pulling up the fundus of the uterus until the cervix was exposed in Douglas's cul-de-sac (or, if the cervix were absent, the opening into the uterus found), the other end of the bowel would be attached around the cervix by interrupted sutures so as to form a canal for the uterine discharges. The abdomen would then be closed in the usual way, with, if desirable, a drainage wick introduced from above downward through the new canal and just below the loop of intestine. Finally, the patient being placed in the lithotomy position, the loop of bowel still held by the forceps would be opened, the bowel cleansed as necessary, each limb of the loop packed with iodoform gauze, and the edges of the opening in the bowel attached to the surrounding skin.

At the completion of the operation we would have a double vagina, each canal being approximately of the size of the colon, and with the nutrition positively provided for by the integrity of the mesocolon. The gauze would be removed and replaced from time to time as necessary, and at the end of ten days or two weeks the septum between the vaginas could be easily removed by clamp pressure.

Such a vagina would be of ample size, would be lined with normal mucous membrane, would not materially contract, and would serve every purpose save that of child-birth; and it would hardly be prudent perhaps to absolutely deny the possibility of a birth through such a canal, considering the ample capacity of the colon under certain circumstances.

Since having this proposition in mind, I have taken pains in a large number of abdominal operations to notice the amount of available slack in the sigmoid flexure and ileum, and have in all cases found that this would be ample for the purpose suggested. In one instance, through an opportunity offered at a penal institution, I was able to carry out this proposition on the body of an adult male a few minutes after death and while the parts were still in practically a living condition. In this case,

after utilizing the colon and finding it to meet every indication, I drew down the lower end of the ileum and found that to be equally available.

We are all familiar with Ruthkowski's suggestion to utilize the sigmoid flexure in the construction or repair of the bladder;

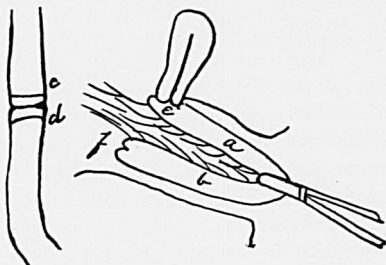


FIG. 2.—*a, b*, Sigmoid drawn into new vagina; *c, d*, anastomosis; *e*, attachment of one end to cervix; *f*, closed end.

but so far as I can learn a somewhat similar use of the bowel for the construction of a new vagina has not heretofore been suggested. The danger of the operation would be apparently not materially greater than that of an ordinary intestinal anastomosis, and that operation has long since been accepted as an established procedure.